

Computer Algebra in Industry 2: Problem Solving in Practice. Edited by Arjeh M. Cohen, Leendert van Gastel, and Sjoerd Verduyn Lunel. John Wiley & Sons, Chichester. (1995). 323 pages. \$28.95.

Contents:

Preface. Part I. Introduction. Computer algebra—Problems and developments (F. Winkler). Using computer algebra to solve ordinary differential equations (M.A.H. MacCallum). Various problems solved by computer algebra (A.H.M. Levelt). Computer algebra: A tool for everyday use? Some experiences with REDUCE at Laborelec. Computer algebra and finite element methods in engineering (E.H. Mund). Part II. Software environments. Object-oriented mathematical modelling—Applied to rolling bearings (D. Fritzson, P. Fritzson, L. Viklund and J. Herber). The application of computer algebra for the discretization and coding of the Navier-Stokes equations (V.V. Goldman, J.A. van Hulzen, A.E. Mynett, A.S. Posthuma, and H.J. van Zuylén). Towards automated program generation in computer algebra environments (J.A. van Hulzen). Part III. Vision. (T. Van Effelterre, L. Van Gool, and A. Oosterlinck). Computer algebra and geometrical optics II: The Eikonal of a symmetric optical system (A. Heck and M. Biemond). Part IV. Heat. Non-linear transient heat conduction in insulation layers (H.P. de Koning, P. van Leijenhurst, and S.M. Verduyn Lunel). A MAPLE excursion into the thermodynamics of binary mixtures (A.H.M. Levelt, Van der Walls, Korteweg, van Laar). Part V. Industrial design. Coating process: An application of symbolic calculus to a free-surface flow (M. Décré, J.-M. Buchlin, J.-L. Colot, and J. Sengier). Strain in rubber coated rollers II (F. Lauwers). Part VI. Control. Computer algebra: A tool in identifiability testing (A. Heck). Symbolics for control: MAPLE used in solving the exact linearization problem. Author index. Subject index.

Notes on Quantum Mechanics: A Course Given by Enrico Fermi (Second edition). Compiled by Robert A. Schluter. University of Chicago Press, Chicago. (1995). 188 pages. \$14.95.

Contents:

Preface to the first edition. 1. Optics—Mechanics analogy. 2. Schrödinger equation. 3. Simple one-dimensional problems. 4. Linear oscillator. 5. W. K. B. method. 6. Spherical harmonics. 7. Central forces. 8. Hydrogen atom. 9. Orthogonality of wave functions. 10. Linear operators. 11. Eigenvalues and eigen functions. 12. Operators for mass point. 13. Uncertainty principle. 14. Matrices. 15. Hermitian matrices—Eigenvalue problems. 16. Unitary matrices—Transformations. 17. Observables. 18. The angular momentum. 19. Time dependence of observables—Heisenberg representation. 20. Conservation theorems. 21. Time-independent perturbation theory—Ritz method. 22. Case of degeneracy or quasi degeneracy—Hydrogen Stark effect. 23. Time-dependent perturbation theory—Born approximation. 24. Emission and absorption of radiation. 25. Pauli theory of spin. 26. Electron in central field. 27. Anomalous Zeeman effect. 28. Addition of angular momentum vectors. 29. Atomic multiplets. 30. Systems with identical particles. 31. Two-electron system. 32. Hydrogen molecule. 33. Collision theory. 34. Dirac's theory of the free electron. 35. Dirac electron in electromagnetic field. 36. Dirac electron in central field—Hydrogen atom. 37. Transformation of Dirac spinors. Introduction to problems for notes on quantum mechanics problems.

PVM: Parallel Virtual Machine: A Users' Guide and Tutorial for Networked Parallel Computing. By Al Geist, Adam Beguelin, Jack Dongarra, Weicheng Jiang, Robert Manchek and Vaidy Sunderam. MIT Press, Cambridge, MA. (1994). 279 pages. \$19.95.

Contents:

Series foreword. Preface. 1. Introduction. 2. The PVM system. 3. Using PVM. 4. Basic programming techniques. 5. PVM user interface. 6. Program examples. 7. How PVM works. 8. Advanced topics. 9. Troubleshooting. Appendices. A. History of PVM versions. B. PVM 3 routines. Bibliography. Index.

Using MPI: Portable Parallel Programming with the Message-Passing Interface. By William Gropp, Ewing Lusk and Anthony Skjellum. MIT Press, Cambridge, MA. (1994). 307 pages. \$24.95.

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1. Background. 2. What's new about MPI? 3. Using MPI in simple programs. 4. Intermediate MPI. 5. Advanced message passing in MPI. 6. Parallel libraries. 7. Other features of MPI. 8. Implementing MPI. 9. Dusty decks: Porting existing message-passing programs to MPI. Glossary of selected terms. Appendices. A. Summary of MPI routines and their arguments. B. The model MPI implementation. C. The MPE multiprocessing environment functions. D. MPI resources on the information superhighway. E. Language details. Bibliography. Subject index. Function and term index.

The Electronic Word, Democracy, Technology, and the Arts. By Richard A. Lanham. University of Chicago Press, Chicago. (1993). 285 pages. \$13.75, £9.50.

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Preface. Acknowledgments. 1. The electronic word: Literary study and the digital revolution. 2. Digital rhetoric and the digital arts. 3. Twenty years after: Digital decorum and bi-stable allusions. 4. The extraordinary convergence: Democracy, technology, theory, and the university curriculum. 5. Electronic textbooks and university structures. 6. Strange lands, strange languages, and useful miracles. 7. The "Q" question. 8. Elegies for the book. 9. Operating systems, attention structures, and the edge of chaos. 10. Conversation with a curmudgeon. Index.